

## SIMATIC PC

### Panel PC 670 / 870 Operating Unit

#### Equipment Manual

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This manual is part of the documentation  
package with the order number  
6AV7691-0AB00-0AB0

## Safety information

This manual contains information which you must observe for your personal safety and to prevent material damage. The information is denoted by a warning triangle and is differentiated as follows, depending on the degree of danger:

---



### Danger

indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.

---



### Warning

indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

---



### Caution

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

---

### Caution

used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

---

### Notice

indicates a situation which, if not avoided, could give rise to an undesirable result or state.

---

### Note

is an important piece of information about the product, the handling of the product or a particular part of the documentation to which attention is to be drawn.

---

## Qualified personnel

Only **qualified personnel** are permitted to start up and operate the device. Qualified personnel for the purposes of the safety information in this manual are persons who hold the necessary authorization to install, ground and label devices, systems and circuits in accordance with the standards of safety engineering.

## Correct usage

Please note the following:

---



### Warning

The device may only be used for the application cases specified in the catalog and the technical description and may only be used in combination with third-party equipment and components recommended or approved by Siemens.

Startup must not take place until it is established that the machine which is to accommodate this component is in conformity with the guideline 98/37 EC.

Appropriate transport, and appropriate storage, installation and assembly, as well as careful operation and maintenance, are required to ensure that the product operates perfectly and safely.

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We have checked the content of this publication for compliance with the described hardware and software. However, discrepancies cannot be excluded, with the result that we cannot guarantee total compliance. The information in this publication is, however, checked regularly, and any necessary corrections are included in the following editions. We welcome any suggestions for improvement.

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Order No. 6AV7691-0AB00-0AA0





# Preface

## Purpose of the manual

This manual contains information which you require when using the operating unit of the SIMATIC Panel PC 670 or PC 870. With this information you can:

- become acquainted with the functions and components of the operating unit,
- separate the operating unit from the computing unit,
- install the Panel PC,
- perform upgrades and install spare parts, providing you fulfill the necessary conditions.

## Target group

The manual is supplied as an electronic document in PDF-format together with the SIMATIC Panel PC 670 or PC 870 and has been written for the following readers:

- users who commission the device themselves or work with the Panel PC (editing, testing),
- service and maintenance engineers who perform conversions and install upgrades or spare parts.

## Documentation

- *Commissioning Instructions*  
The Commissioning Instructions are supplied as a paper document. The document is intended for commissioning engineers and system administrators. The Commissioning Instructions describe briefly the most important steps for commissioning the hardware and software.
- *SIMATIC Panel PC 670/PC 870 Operating Unit Equipment Manual*  
The manual is supplied on CD together with the SIMATIC Panel PC 670 or PC 870 as an electronic document in PDF-format. It is intended for the commissioning engineers and service and maintenance technicians who install the Panel PC and perform maintenance work on the operating unit. Furthermore, the Equipment Manual provides an overview of how to use the controls of the operating unit.
- *SIMATIC Panel PC 670 Computing Unit Equipment Manual*  
The manual is supplied on CD together with the SIMATIC Panel PC 670 as an electronic document in PDF-format. It is intended for the commissioning engineers, and service and maintenance technicians who install upgrades or perform error analyses on the computing unit.
- *SIMATIC Panel PC 870 Computing Unit Equipment Manual*  
The manual is supplied on CD together with the SIMATIC Panel PC 870 as an electronic document in PDF-format. It is intended for the commissioning engineers, and service and maintenance technicians who install upgrades or perform error analyses on the computing unit.

## Notation

The following conventions are used in this manual:

<i>Motor off</i>	Text that is displayed on the operating unit is printed in Courier typeface.
<i>Variable</i>	Symbolic names that stand for variable values appearing on the screen are printed in Courier italic typeface.
<i>Screens</i>	Selectable functions are printed in standard italic typeface.
ESC	Names of keys and buttons are shown in a different typeface.

## History

Edition	Comments
03/00	Initial release of the equipment manual SIMATIC Panel PC 670 – Operating Unit.
07/01	Initial release of the equipment manual SIMATIC Panel PC 670/870 – Operating Unit

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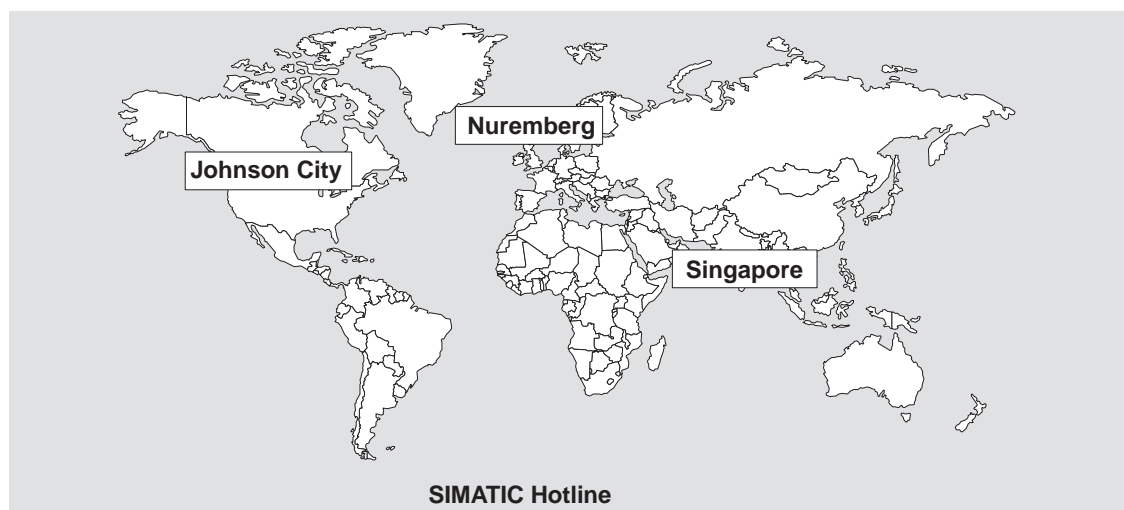
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- HMI®
- ProTool®
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- ProTool/Pro®
- SIMATIC Multi Panel®
- SIMATIC Multifunctional Platform®
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  - from the **Internet** under <http://www.ad.siemens.de/simatic-cs>
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 To access the mailbox, use a modem with up to V.34 (28.8 Kbps) with the parameters set as follows: 8, N, 1, ANSI; or dial in via ISDN (x.75, 64 Kbps)
- You can find your local customer service representative for Automation & Drives in our customer service representative database
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# Product Overview

# 1

## Usage

The SIMATIC Panel PC 670 and PC870 are industry-standard PC platforms for demanding tasks in the field of PC-based automation. They are designed as fitted units for local use directly on the machine in

- switch cabinets/consolas
- 19" cabinets/racks.

The Panel PC consists of the two components **computing unit** and **operating unit**.

The present equipment manual basically describes the specific characteristics of the operating unit, but also makes reference to the complete unit where necessary – for example, with regard to the dimensions for mounting, maintenance and in the technical data

## 1.1 Panel PC 670: Computing and operating units

The computing unit is screwed to the rear of the operating unit with two mounting rails and can be separated from the latter. Figure 1-1 shows an example of the complete device and indicates the connection between the computing unit and the operating unit (2 of the 4 screw joints are marked with circles). Details on how to separate the two components are contained in Section 4.2.1.

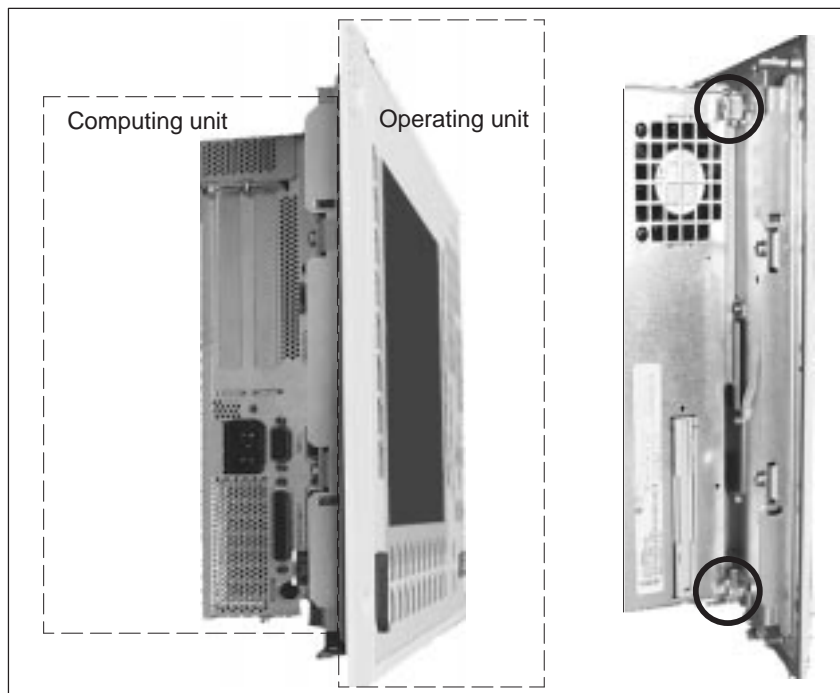


Fig. 1-1 Panel PC: Computing unit and operating unit

### Brief description

The SIMATIC Panel PC 670 can be supplied with various front panels, which differ by way of their display size and style of operation, which is either by **membrane keyboard** or **touchscreen**.

The following different versions are available:

#### Keyboard versions

- Color display with back-lighting
  - 10.4" TFT screen; 640 x 480 pixel resolution  
or
  - 12.1" TFT screen; 800 x 600 pixel resolution  
or
  - 15.1" TFT screen; 1024 x 768 pixel resolution
- Membrane keyboard with alpha, numeric, cursor and control keypad

- Function keys/soft keys
  - 2 x 8 vertical rows of keys with soft-key and optional direct-key functions
  - 2 x 10 horizontal rows of keys with soft-key functions
  - labeling strips for the rows of soft keys
- Shift key for switching to the second level of key functions
- Integrated piezo mouse
- Status LEDs for power supply and temperature
- USB interface on front side for connecting external peripheral devices
- Degree of protection IP 54 / IP 65 <sup>1)</sup> depending on version
- Mounting: Clamps on rear side or 19" screw fixing

#### **Touchscreen versions**

- Color display with back-lighting
  - 12.1" TFT screen; 800 x 600 pixel resolution or
  - 15.1" TFT screen; 1024 x 768 pixel resolution
- Status LEDs for power supply and temperature
- USB interface on front side for connecting external peripheral devices <sup>2)</sup>
- Degree of protection IP 54 / IP 65 / NEMA 4 <sup>1)</sup> depending on version
- Mounting: Clamps on rear side; alternatively 19" screw fixing for 15.1" version

---

<sup>1)</sup> see Technical Data (Appendix)

<sup>2)</sup> not for NEMA-standard versions (see Technical Data in Appendix)

## 1.2 Panel PC 870: Computing and operating units

The computing unit is screwed to the rear of the operating unit with two mounting rails and can be separated from the latter (see Section 4.2.2).

Figure 1-2 shows an example of the complete device:

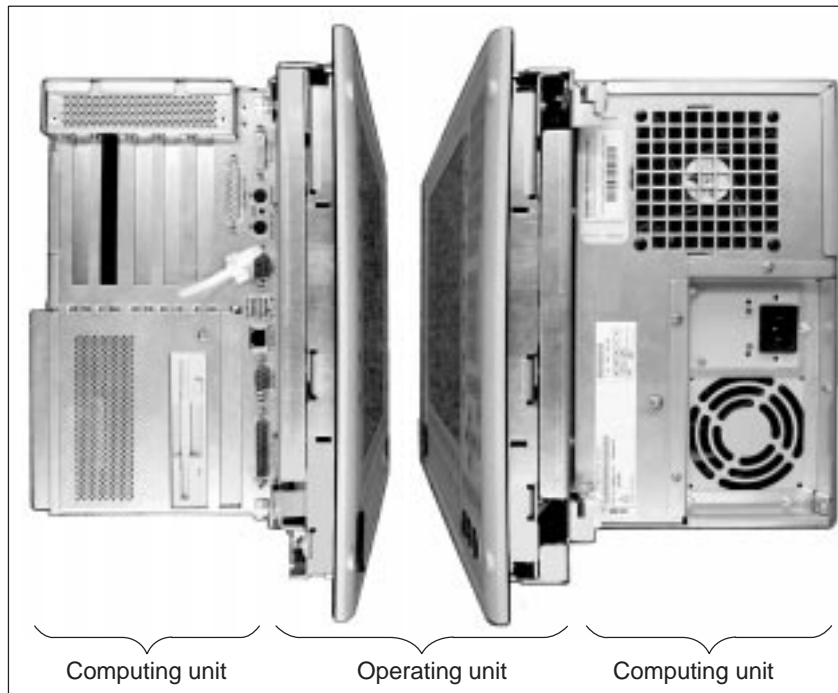


Fig. 1-2 Panel PC 870: Complete device, comprising computing unit and operating unit

### Brief description

The SIMATIC Panel PC 870 can be supplied with various front panels, which differ by way of their display size and style of operation, which is either by **membrane keyboard** or **touchscreen**.

The following different versions are available:

#### Keyboard versions

- Color display with back-lighting
  - 12.1" TFT screen; 800 x 600 pixel resolution
  - or
  - 15.1" TFT screen; 1024 x 768 pixel resolution
- Membrane keyboard with alpha, numeric, cursor and control keypad
- Function keys/soft keys
  - 2 x 8 vertical rows of keys with soft-key and optional direct-key functions
  - 2 x 10 horizontal rows of keys with soft-key functions
  - labeling strips for the rows of soft keys

- Shift key for switching to the second level of key functions
- Integrated piezo mouse
- Status LEDs for power supply and temperature
- USB interface on front side  
for connecting external peripheral devices
- Degree of protection IP 54 / IP 65 <sup>1)</sup> depending on version
- Mounting: Clamps on rear side or 19" screw fixing

#### **Touchscreen version**

- Color display with back-lighting,  
15.1" TFT screen; 1024 x 768 pixel resolution
- Status LEDs for power supply and temperature
- USB interface on front side  
for connecting external peripheral devices <sup>2)</sup>
- Degree of protection IP 54 / IP 65 / NEMA 4 <sup>1)</sup>  
depending on version
- Mounting: Clamps on rear side;  
alternatively 19" screw fixing

---

<sup>1)</sup> see Technical Data (Appendix)

<sup>2)</sup> not for NEMA-standard versions (see Technical Data in Appendix)





## Description of Device

# 2

Table 2-1 indicates which combinations of operating units and computing units can be delivered.

Table 2-1 Combinations of operating units and computing units which can be delivered

Available in combination with	10"	12"	12" Touch	15"	15" Touch
PC 670	x	x	x	x	x
PC 870	—	x	—	x	x
PC 670 / 870 with NEMA certificate	—	—	x	—	x

## 2.1 Operating units with key-based front panels

The number of keys, their labeling and their functionality are identical on all operating units featuring key-based front panels. The various types of front panel differ only in the arrangement the keys and the size and type of display. Figure 2-1 shows the front view of the 12" version as an example to illustrate the status indicators, the different keypads, the USB interface, display and mouse.

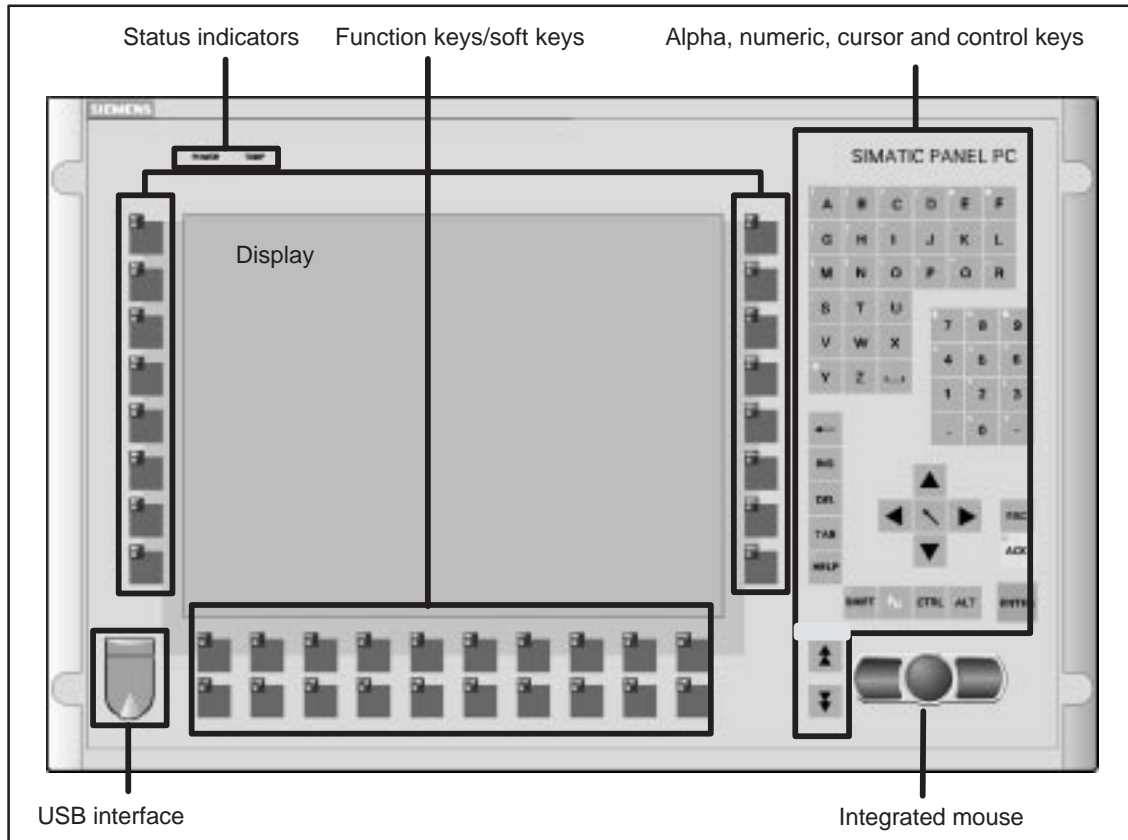


Fig. 2-1 Example: 12" version of the operating unit with key-based front panel

### 2.1.1 Status indications

Information about the operation status is supplied by the two LEDs at the upper left side of the keyboard:

- The left LED ("POWER") lights when the power supply works
- The right LED ("TEMP") lights when a temperature threshold is exceeded (see "SOM-program" in chapter 7 of the "Computing Unit" Manual).

## 2.1.2 Keyboard

The keyboard is subdivided into different functional groups of keys:

- function keys, soft keys
- control keys
- alpha keys
- numeric keys
- cursor keys

### Function keys, soft keys

The function keys arranged on the left and right of the display and in two rows at the bottom of the display possess LEDs and can be assigned freely.



Fig. 2-2 Function keys

### Control keys

The control keys are used for higher-level editing and control functions in the different applications:

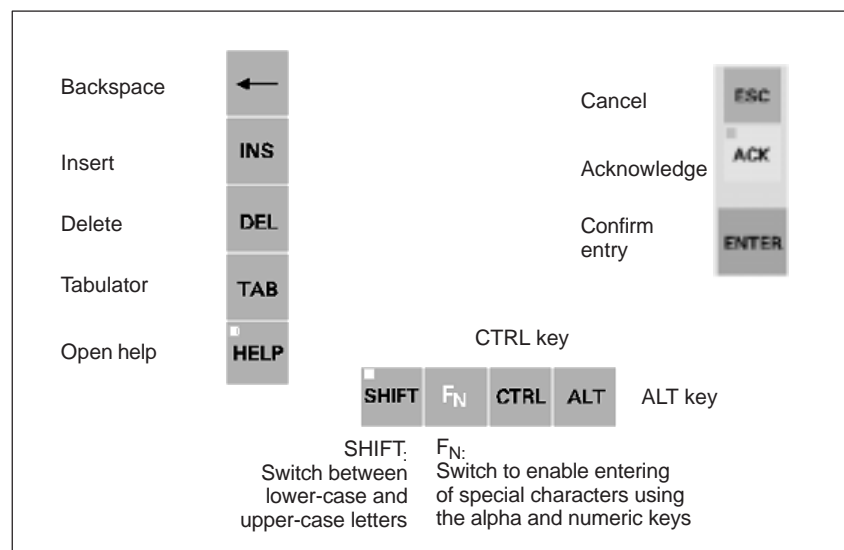


Fig. 2-3 Control keys

## Alpha keys

The alpha keys are used to enter letters, special characters, spaces and underscores:

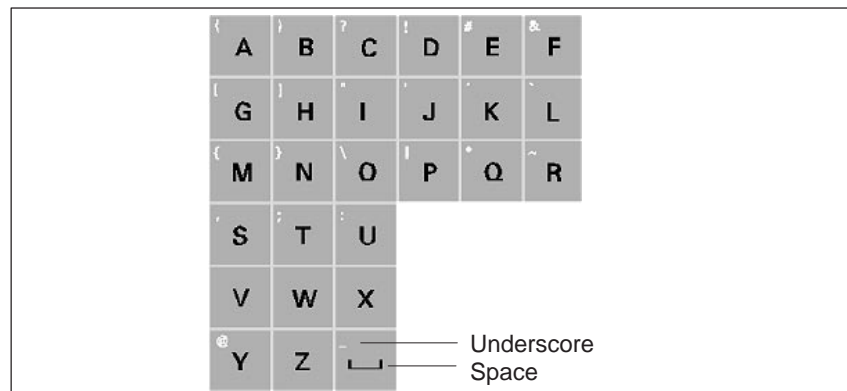


Fig. 2-4 Alpha keys

## Switching between upper-case and lower-case letters

In their basic assignment, the alpha keys are used to enter lower-case letters. To enter upper-case letters, press and hold down SHIFT (see Figure 2-3). The LED on the SHIFT key lights and you can then enter upper-case letters with the corresponding alpha keys.

To enter lower-case letters again, release SHIFT. The LED on the SHIFT key goes out and you can enter lower-case characters again.

## Entering special characters

Most of the alpha keys are also assigned special characters. The special characters are identified in white, in the top left corner of the keys concerned.

To enter the special character you require, press the  $F_N$  control key (see Figure 2-3) and, *in addition*, the appropriate alpha key. If you release the  $F_N$  key, you can return to entering the characters of the basic alpha key assignment.

## Numeric keys

The numeric keys are used to enter the digits "0" to "9", various special characters, and the signs "+" and "-", as well as hyphens ("—") and decimal points "·":

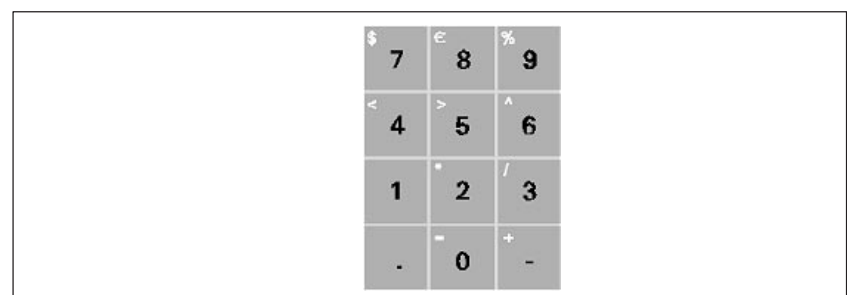


Fig. 2-5 Numeric keys

### Entering special characters, arithmetic characters and signs

Most of the numeric keys have also been assigned special characters, arithmetic characters or the plus sign. The special characters are identified in white, in the top left corner of the keys concerned.

To enter the plus sign, the special character or the arithmetic character you require, press the  $F_N$  control key (see Figure 2-3) and, *in addition*, the appropriate numeric key.

If you release the  $F_N$  key, you can return to entering the characters of the basic numeric key assignment.

### Cursor keys

The cursor keys are used for navigation (e.g. for scrolling) or to move the cursor. The following figure indicates the equivalents of the Panel PC cursor keys on conventional PC keyboards:

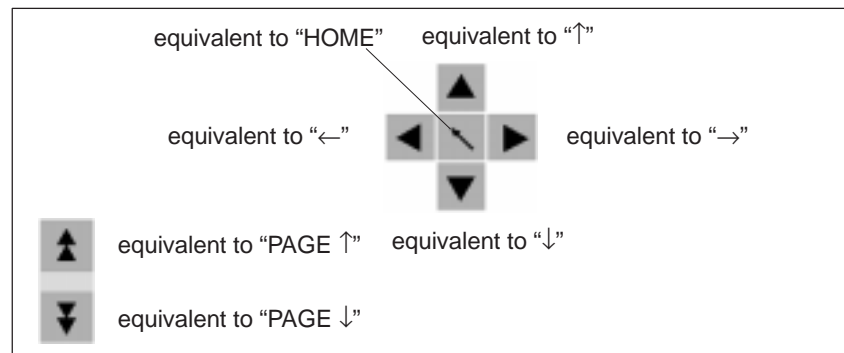


Fig. 2-6 Cursor keys and their PC keyboards equivalents

### Connecting external keyboards

The keyboard layout for Windows 98 has been set to "English/USA International". When using an external keyboard with the "English/USA International" layout, the key codes of the internal and external keyboards are identical; for example, if you enter a "y" on the external keyboard and a "y" on the internal keyboard, you get a "y" on the display in either case.

## 2.1.3 Integrated mouse

The integrated USB mouse with the two mouse buttons is a "piezo mouse", i.e. the direction of the mouse pointer movement is determined by the pressure position on the center circular button and the speed of the mouse pointer movement by the intensity of the pressure. The parameters can be modified under "System Setting/Mouse".

If you wish, you can also connect an external mouse via the front USB (refer to Section 2.3).

## 2.2 Operating units with touchscreen front panels

The 12.1" version and the 15.1" version of the touchscreen front panels differ in their dimensions and the size of their displays. The 12.1" version does not have drill holes (covers) at the sides.

Figure 2-7 shows the 15.1" version as an example to illustrate the status indicators, the USB interface and the display.

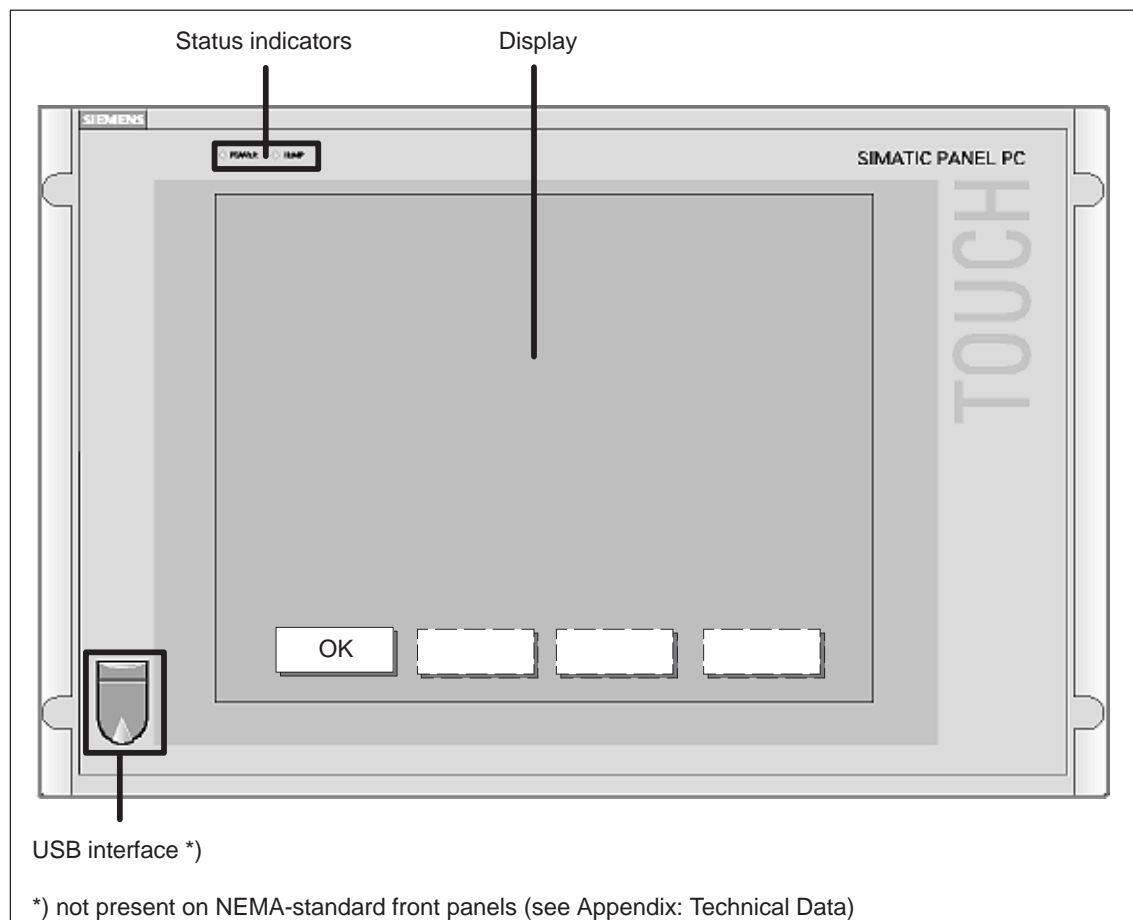


Fig. 2-7 Example: 15.1" operating unit with touchscreen front panel

### Operation

The device is operated by touching the touch-sensitive display with your finger in accordance with the functions displayed for that specific application, e.g. by applying pressure to a displayed button.

### Status indicators

Information about the operation status is supplied by the two LEDs at the upper left side of the keyboard (see paragraph 2.1.1):

- The left LED ("POWER") lights when the power supply works
- The right LED ("TEMP") lights when a temperature threshold is exceeded (see "SOM-program" in chapter 7 of the "Computing Unit" manual).

## 2.3 Interfaces

The operating unit has interfaces on the front and rear sides.

### 2.3.1 Front-side USB interface

On the front side of the panel (see Figures 2-1 and 2-7) there is a USB interface protected by a rubber cover. This can be used, for example, to connect an external keyboard or an external mouse.

---

#### Note

When using generally available USB peripheral devices, you should note that their electromagnetic compatibility is frequently designed only for an office environment.

Such devices are adequate for commissioning and for servicing purposes; for industrial applications, however, we recommend the use of industry-standard components.

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#### Note

The NEMA-standard versions do not possess a front-side USB interface (see Appendix: Technical Data)

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### 2.3.2 Rear-side interfaces

On the rear side (see Figure 2-8) there are two ribbon cables for connection of the computing unit:

- the I/O USB cable K1 at X1 for all signals, apart from the display interface, relevant for the connection of operating units.
- the display cable K2.

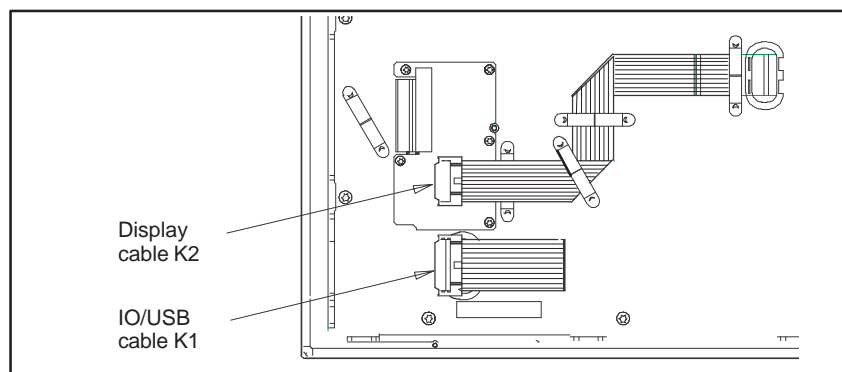
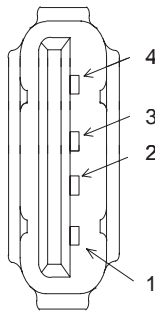


Fig. 2-8 Interfaces on the rear side of the operating unit

### 2.3.3 Interface assignment

#### Front-side USB interface

Table 2-2 Pin assignment of front-side USB interface

	Pin	Name	Type	Remark
	4	USB_GND	V	Chassis ground for external USB interface
	3	USB_D0P	B	Data+, USB channel 0
	2	USB_D0M	B	Data-, USB channel 0
	1	USB_P5V_fused	V	+ 5V (fused) for external USB interface; max. 100 mA, use an external power supply for devices requiring higher currents

#### Signal type

B	Bi-directional
O	Output
V	Voltage

#### Note

The NEMA-standard versions do not possess a front-side USB interface (see Appendix: Technical Data)



## 2.4 Device dimensions

### 2.4.1 Dimensions of Panel PC 670

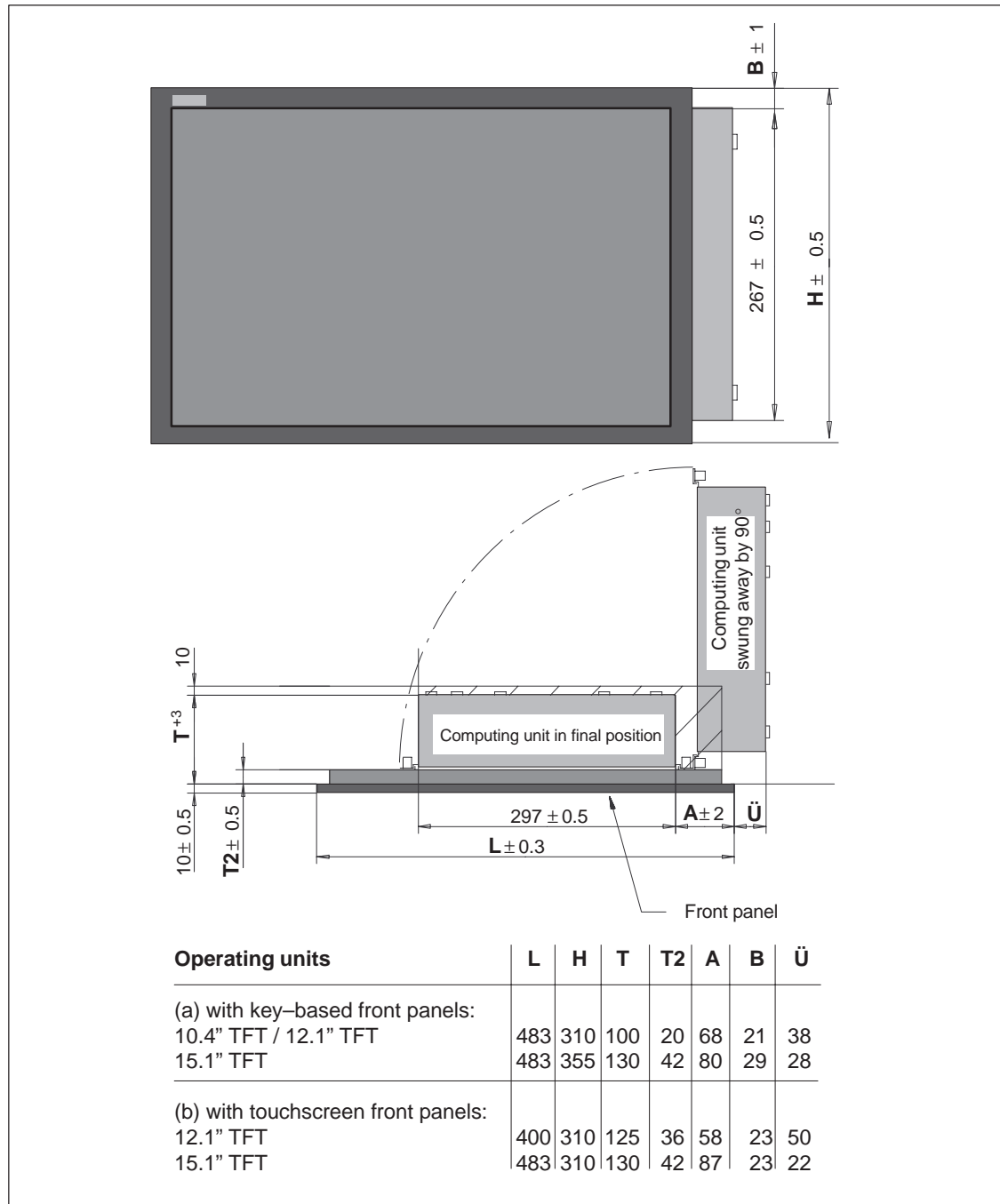


Fig. 2-9 Device dimensions Panel PC 670 (in mm); all dimensions without screw protrusions

## 2.4.2 Dimensions of Panel PC 870

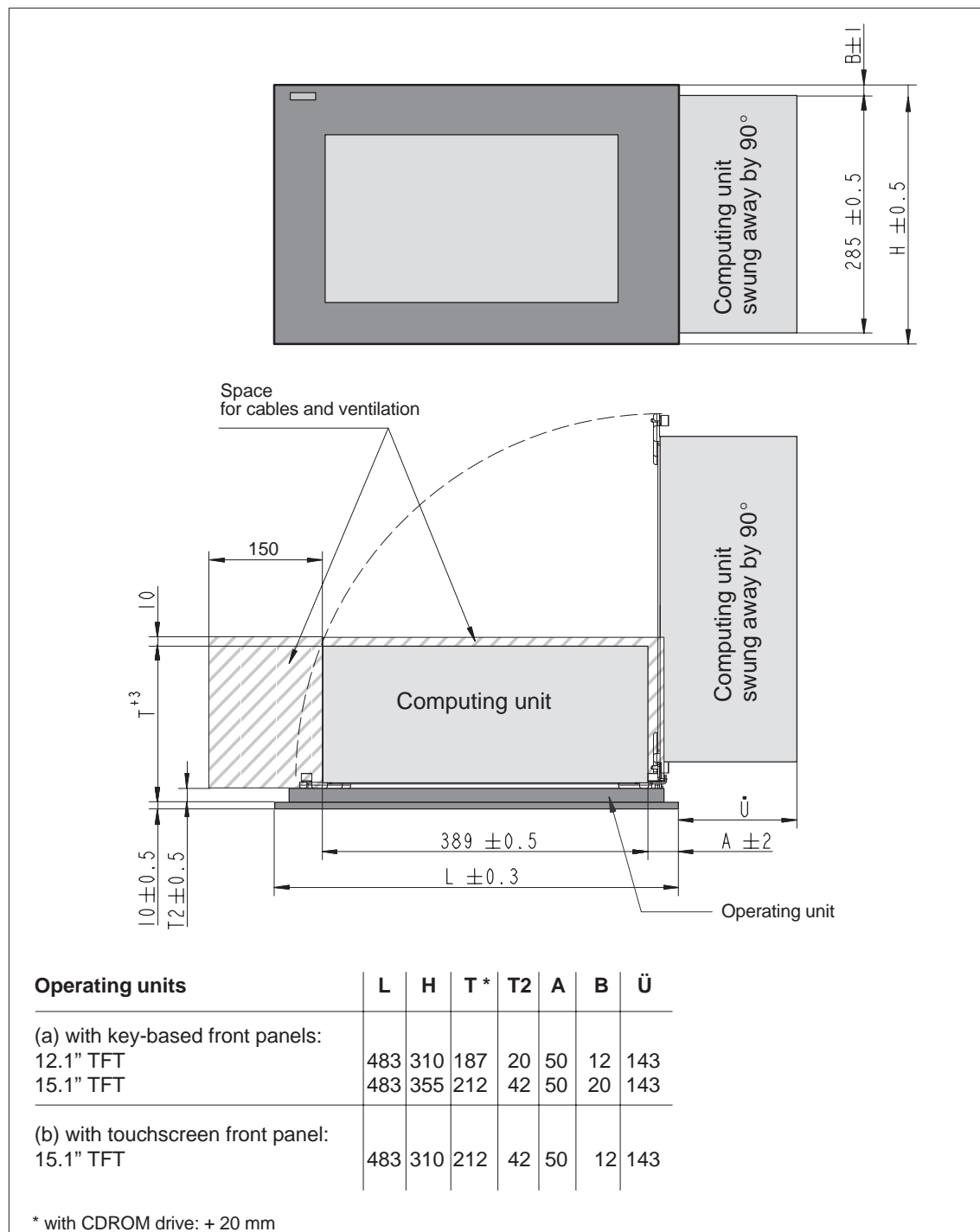


Fig. 2-10 Device dimensions Panel PC 870 (in mm); all dimensions without screw protrusions

# Mounting

## 3.1 Mounting cut-out

### 3.1.1 Panel PC 670

A mounting cut-out is required as shown in the figure and explanatory table below:

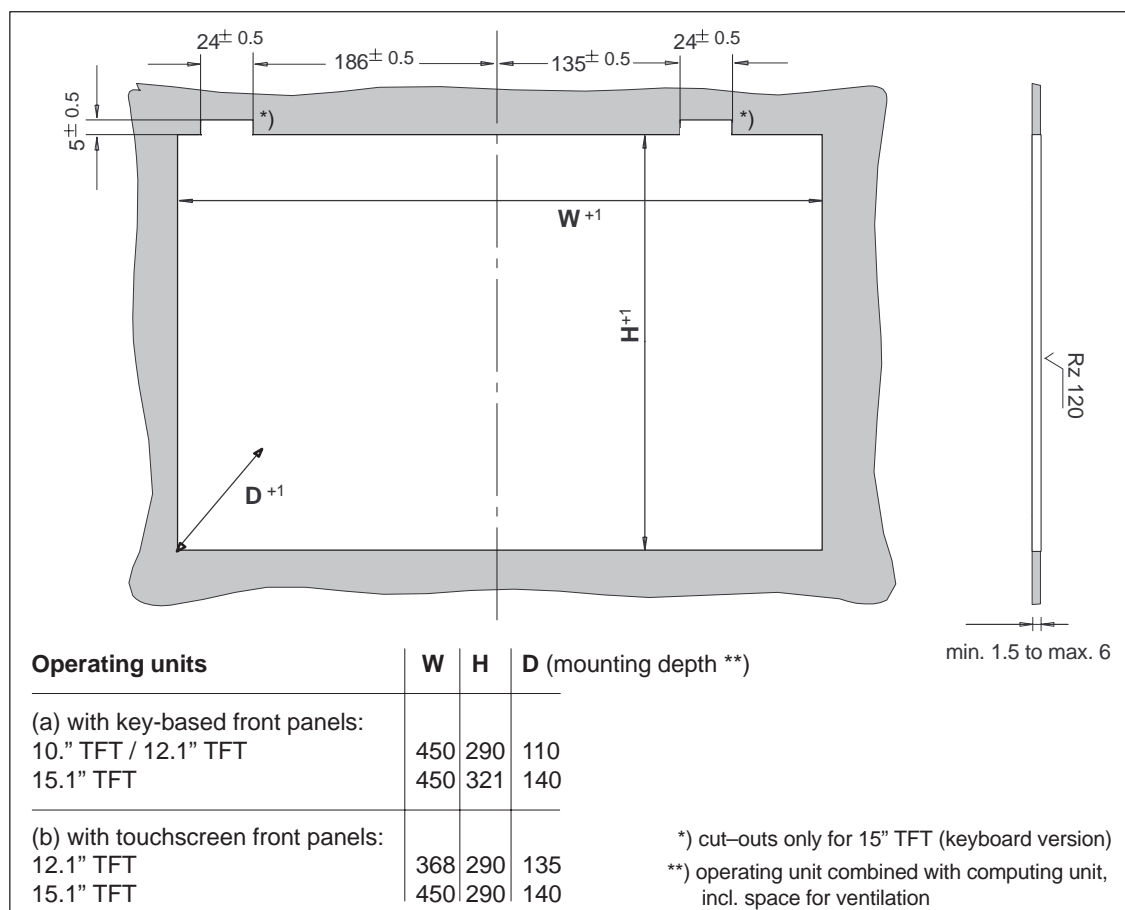


Fig. 3-1 Mounting cut-out for standard mounting of Panel PC 670 (width x height x depth in mm)

When installing in an enclosed housing, ensure that there is sufficient volume for air circulation and, if necessary, for swinging out the computing unit (see also Figures 2-9 and 4-1).

The maximum air intake temperature must not exceed 45°C.

### 3.1.2 Panel PC 870

A mounting cut-out is required as shown in the figure and explanatory table below:

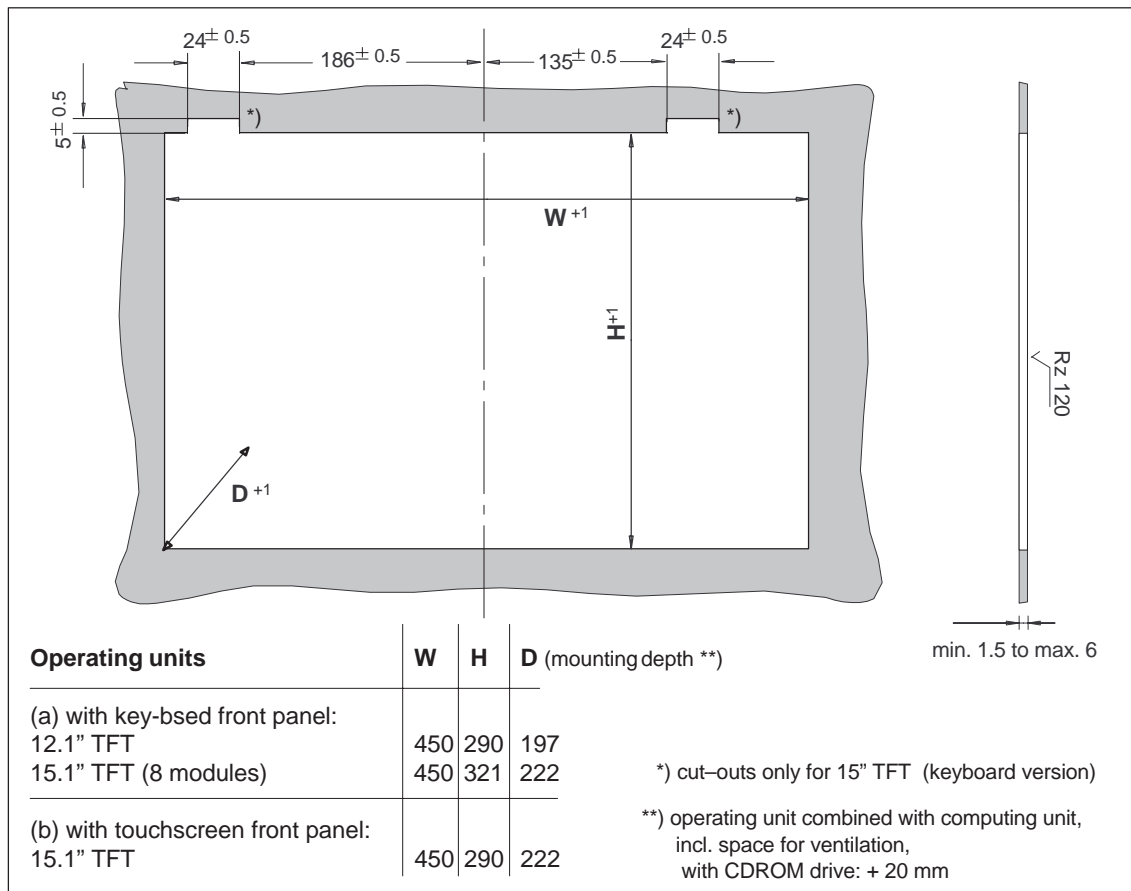


Fig. 3-2 Mounting cut-out for standard mounting of Panel PC 870 (width x height x depth in mm)

When installing in an enclosed housing, ensure that there is sufficient volume for air circulation and, if necessary, for swinging out the computing unit (see also Figures 2-9 and 4-1).

The maximum air intake temperature must not exceed 45°C.

## 3.2 Installation

### 3.2.1 Panel PC 670

The operating unit can be fitted in the mounting cut-out with either clamps or screws. Screwed joints are **not possible** with the **12.1" touchscreen version!**

Protection class IP 65 is possible when the operating unit is secured with clamps (in conjunction with a continuous gasket).

Protection class IP 54 is achieved with screw fixings.

#### Mounting location and dimensions

The permissible mounting locations will depend on the attached computing unit.

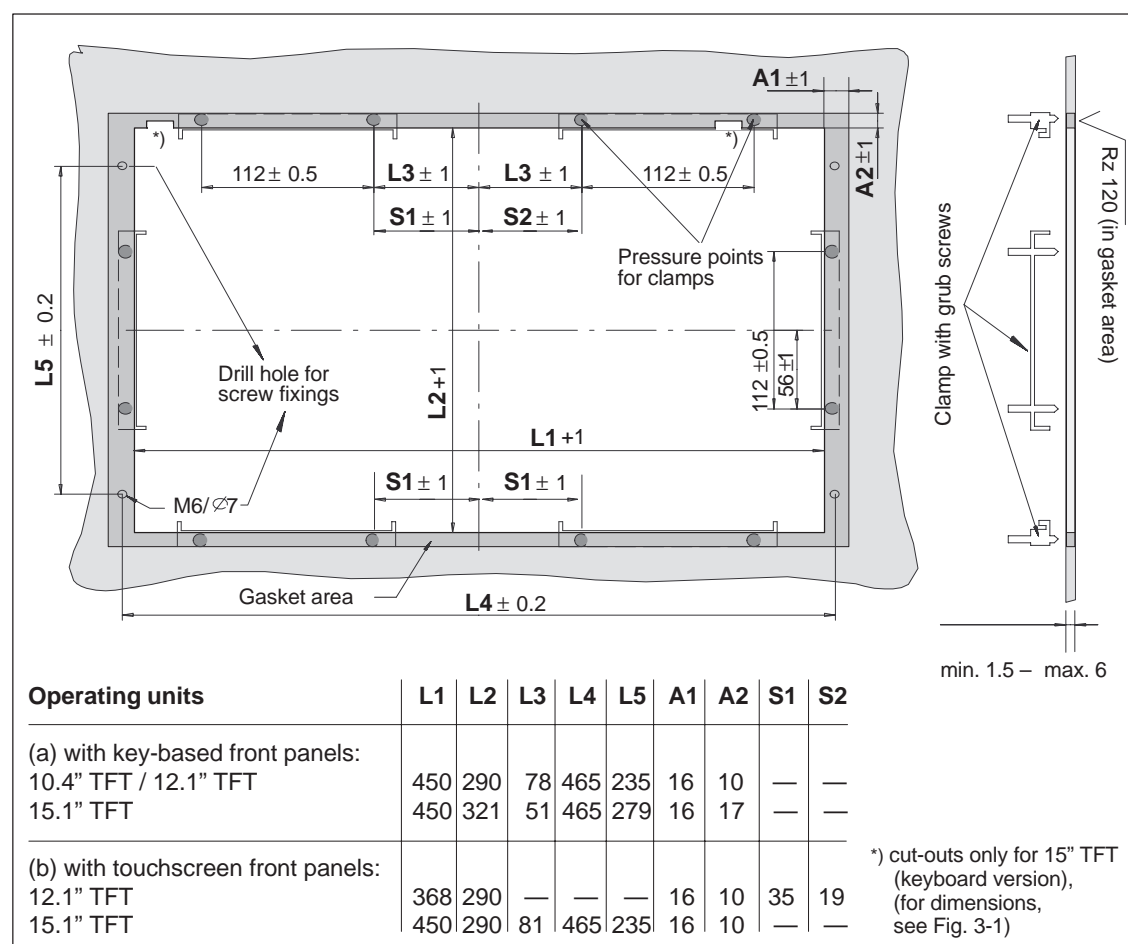


Fig. 3-3 Dimensions for installation of the operating unit of Panel PC 670

### Installation with clamp fixing

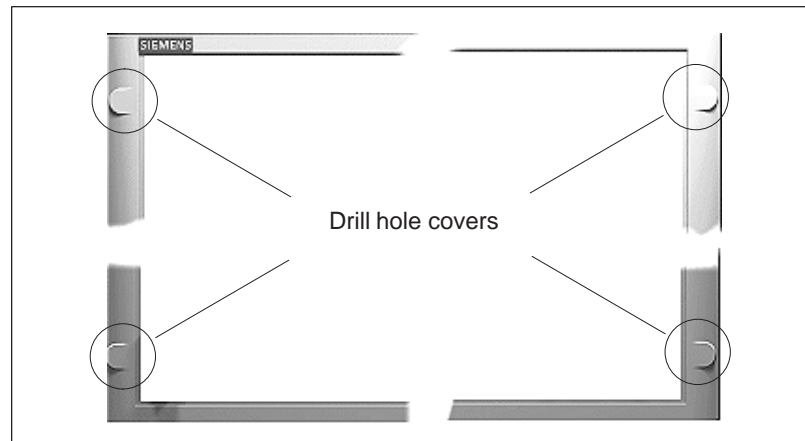
The clamps and grub screws required for installation are supplied with the device. Proceed as follows:

1. Insert the complete operating unit and computing unit into the mounting cut-out prepared as described in Section 3.1, working from the front.
2. From the rear, fix the operating unit in position in the mounting cut-out using the six clamps (see Figure 3-3) by tightening the grub screws (torque 0.4 - 0.5 Nm).

### Installation with screw fixing

The 12.1" touchscreen version is not suitable for installation with screw fixings. With the other operating units, proceed as follows:

1. Drill suitable holes around the prepared mounting cut-out (see Section 3.1) as specified for L4 and L5 in Figure 3-3.
2. Carefully knock out the drill hole covers on the front side of the operating unit:



3. Working from the front, insert the complete operating unit and computing unit into the mounting cutout, ensuring that it is flush with the drill holes.
4. Fix the operating unit at the drill holes using suitable screws and nuts.

## 3.2.2 Panel PC 870

The operating unit can be fitted in the mounting cut-out with either clamps or screws.

- Protection class IP 65 is possible when the operating unit is secured with clamps (in conjunction with a continuous gasket).
- Protection class IP 54 is achieved with screw fixings.

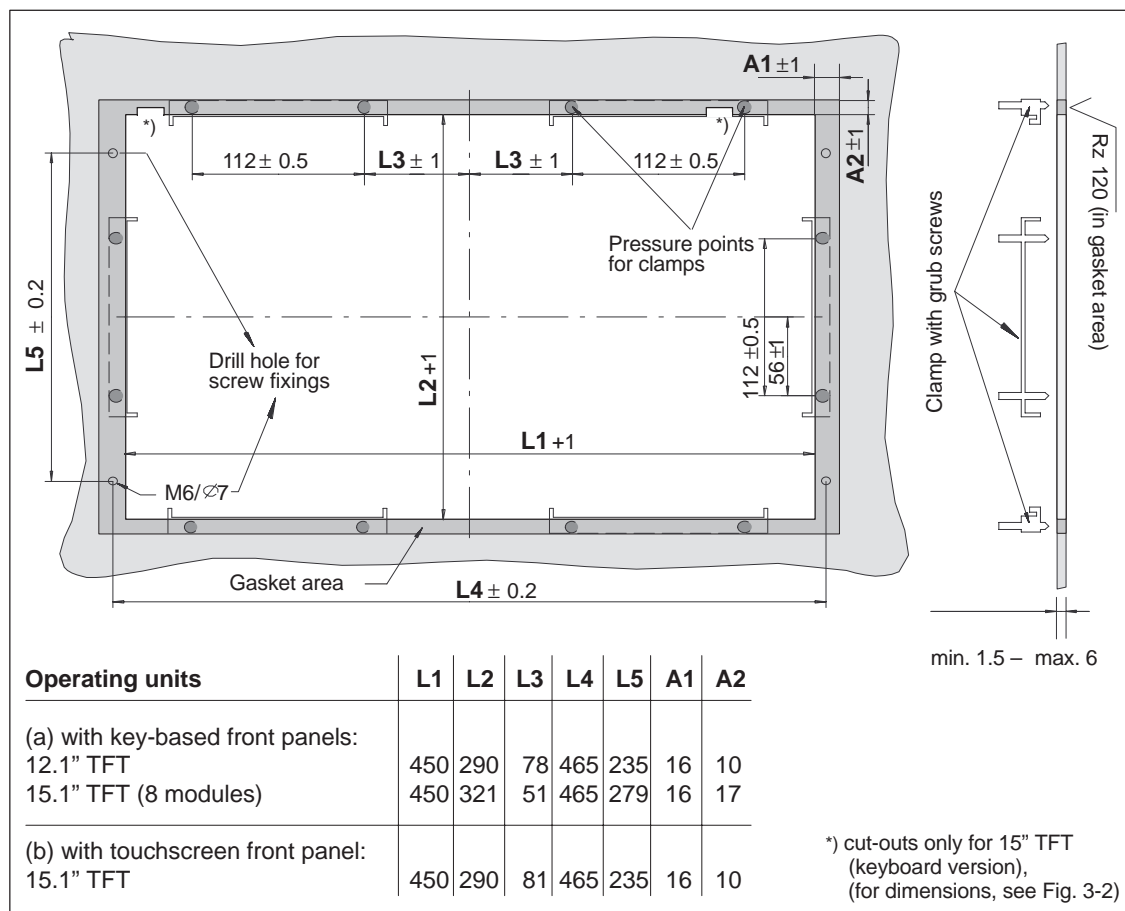


Fig. 3-4 Dimensions for installation of the operating unit of Panel PC 870

### Installation with clamp fixing

The clamps and grub screws required for installation are supplied with the device. Proceed as follows:

1. Insert the complete operating unit and computing unit into the mounting cut-out prepared as described in Section 3.1, working from the front.
2. From the rear, fix the operating unit in position in the mounting cut-out using the six clamps (see Figure 3-3) by tightening the grub screws (torque 0.4 - 0.5 Nm).
3. Hook the computing unit into the two hinges (see Figure 3-5).
4. Make the electrical connections.
5. Swing the computing unit to the operating unit and fix in position by tightening the four knurled screws.

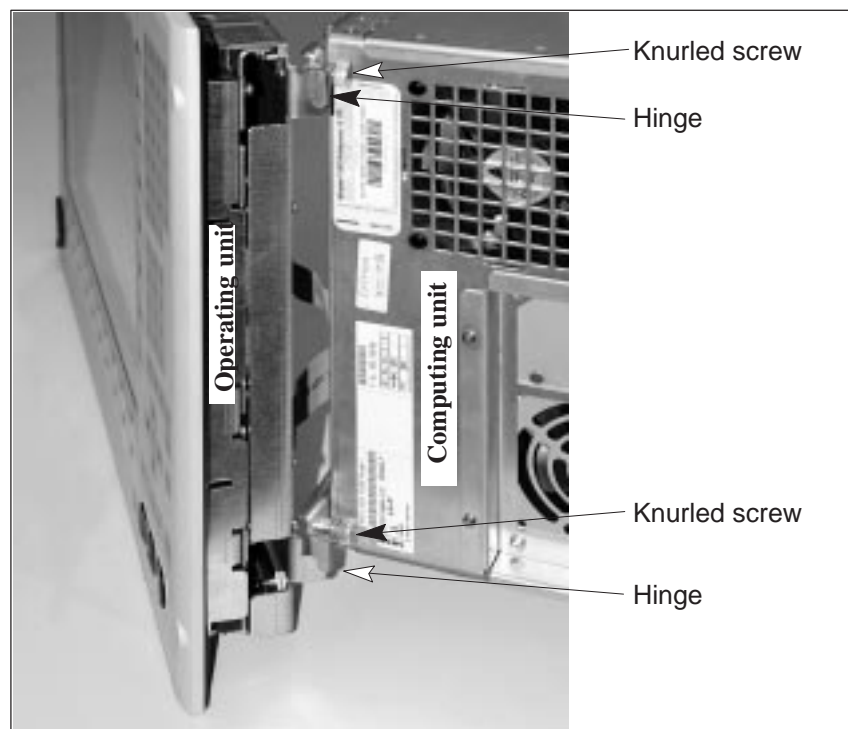


Fig. 3-5 Joining the operating and computing units

### Installation with screw fixing

Proceed as follows (Figure 3-6):

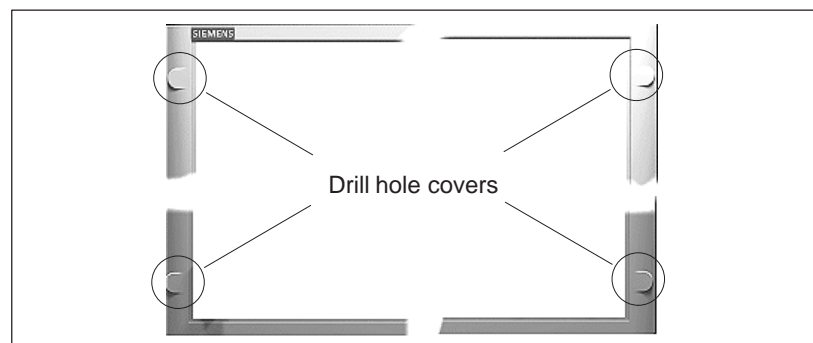


Fig. 3-6 Installation with screw fixing

1. Drill suitable holes around the prepared mounting cut-out (see Section 3.1) as specified for L4 and L5 in Figure 3-3.
2. Carefully knock out the drill hole covers on the front side of the operating unit.
3. Fix the operating unit at the drill holes using suitable screws and nuts.
4. Continue as from step 3 for clamp fixing.



## Maintenance

### 4.1 Spare parts and accessories

The spare parts and accessories which can be delivered are listed below.

#### 4.1.1 Spare parts

The only spare part is the operating unit itself.

A generally valid order no. cannot be given because it depends on the order number of the actual equipment configuration. This order no. you will get from your SIEMENS contact partner.

#### 4.1.2 Accessories

You can get the following accessories:

item	order no.
direct key module	6AV7671-7DA00-0AA0
protection foil for protecting the touch screen against pollution or scratching – for 12" touch screen *) – for 15" touch screen	6AV7671-2BA00-0AA0 6AV7671-4BA00-0AA0
soft key labeling strips for Panel PC 670 – for 10" keyboard version *) – for 12" keyboard version – for 15" keyboard version	6AV7671-0CA00-0AA0 6AV7671-3CA00-0AA0 6AV7671-5CA00-0AA0
printing form pattern for labeling strips	purchasing opportunity by download from the customer support (see preface)

---

\*) not available for PC 870

## 4.2 Detaching the operating unit from the computing unit

It may at some stage become necessary to separate the operating unit from the computing unit, e.g. to replace the operating unit.

### 4.2.1 Panel PC 670

#### Swinging open the computing unit

To swing the computing unit away from the operating unit, proceed as follows:

1. Undo the knurled screws which secure the computing unit to the rear side of the operating unit.
2. Swing the computing unit away to the left, whereby the two left clips act as hinges and thus prevent an unintentional releasing of the computing unit:

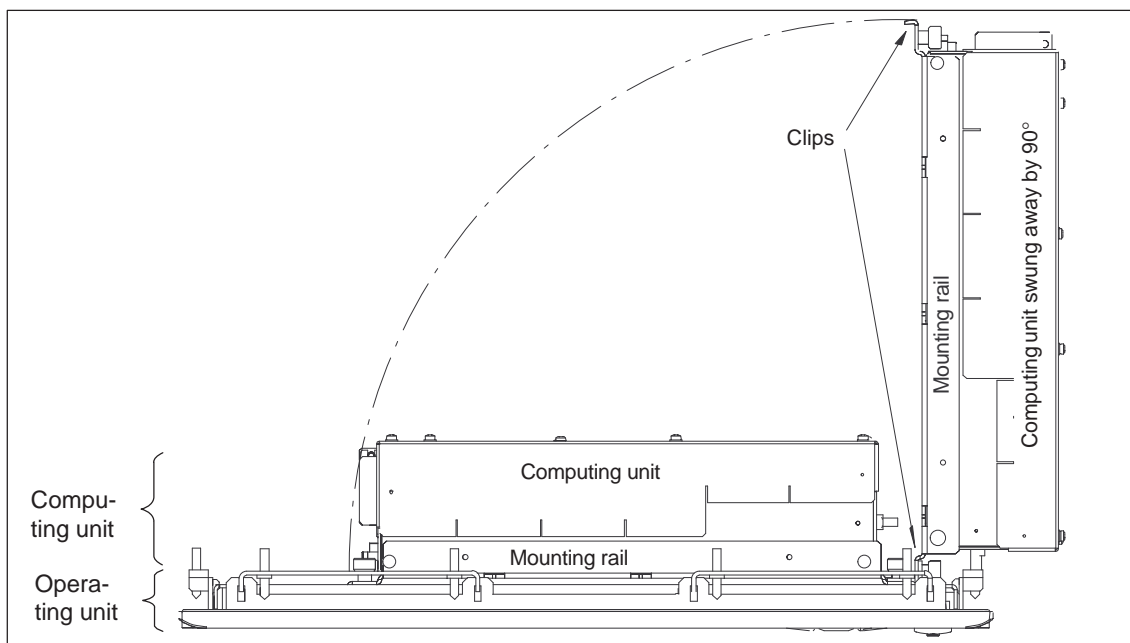


Fig. 4-1 Swinging the computing unit away from the operating unit (viewed from above)

You can now access the connections on the rear panel of the operating unit.

### Removing the computing unit completely

To remove the computing unit completely, continue as follows:

3. Remove the cable connectors K1 and K2 of the operating unit (see Figure 4-2) from their corresponding counterparts on the computing unit.

Two mounting rails are screwed to the computing unit. The two ends of these rails are formed as clips (see Figure 4-1).

4. Lift the computing unit off horizontally by removing these clips from the corresponding slits on the operating unit (see Figure 4-2 below).
5. Place the computing unit down carefully.

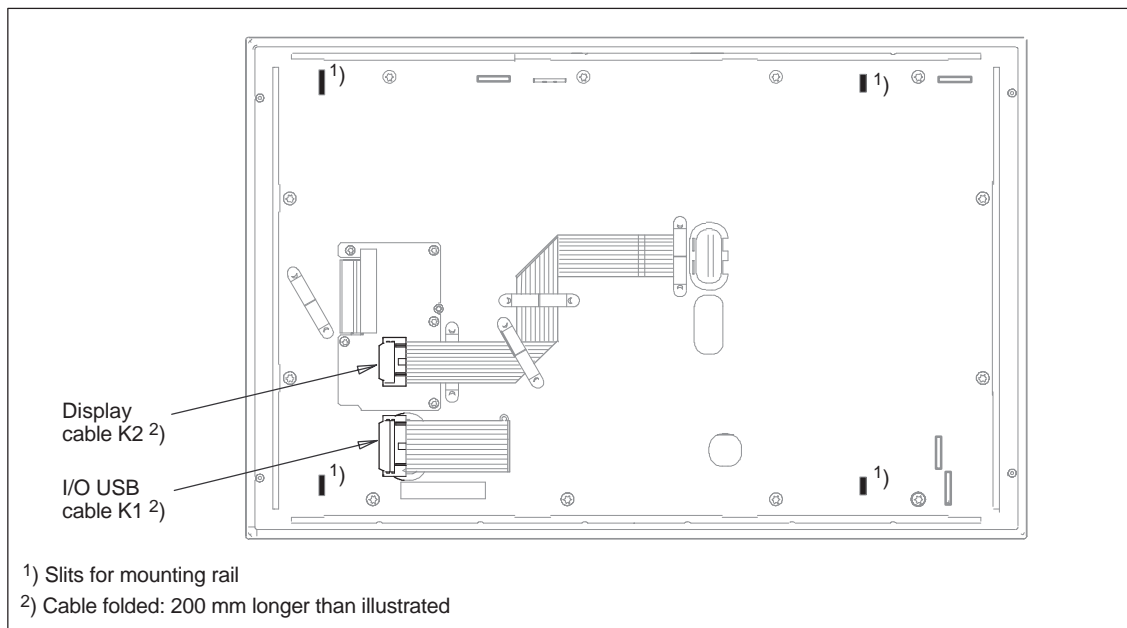


Fig. 4-2 Rear side of operating panel with positions of interfaces

If necessary, you can now remove the operating unit by loosening the six clamps which secure the operating unit to the mounting panel (see Figure 3-3).

### Securing the computing unit

Reinstall and swing the computing unit back into place in the reverse order to that described above.

## 4.2.2 Panel PC 870

### Removing the computing unit

Proceed as follows:

1. Disconnect the power supply.
2. Swing open the mounting panel to obtain access to the rear of the PC 870.
3. Loosen the four (retained) knurled screws which secure the computing unit to the rear side of the operating unit (see also Figure 3–3).
4. Swing the computing unit away to the left, whereby the two left clips act as hinges and thus prevent an unintentional releasing of the computing unit.

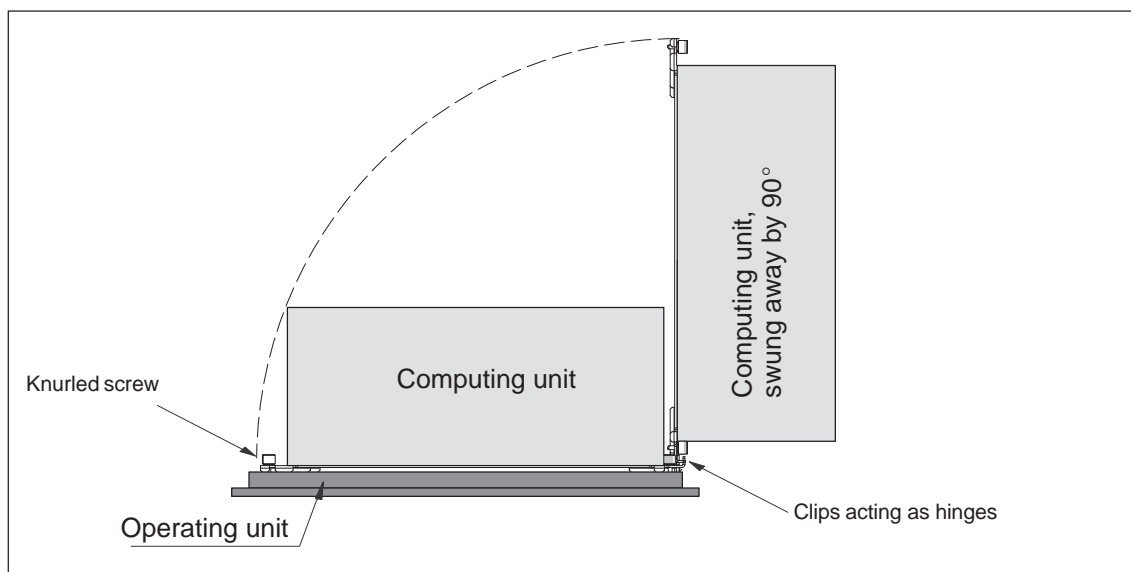


Fig. 4-3 Swinging the computing unit away from the operating unit (viewed from above)

5. Remove the cable connectors K1 and K2 of the operating unit (see Figure 4-4) from their corresponding counterparts on the computing unit.
6. Lift the computing unit off the hinges of the operating unit and place it down carefully.

If necessary, you can now remove the operating unit by loosening either the screws or, depending on the version, the six clamps which secure the operating unit to the mounting panel (see Figure 3-3).

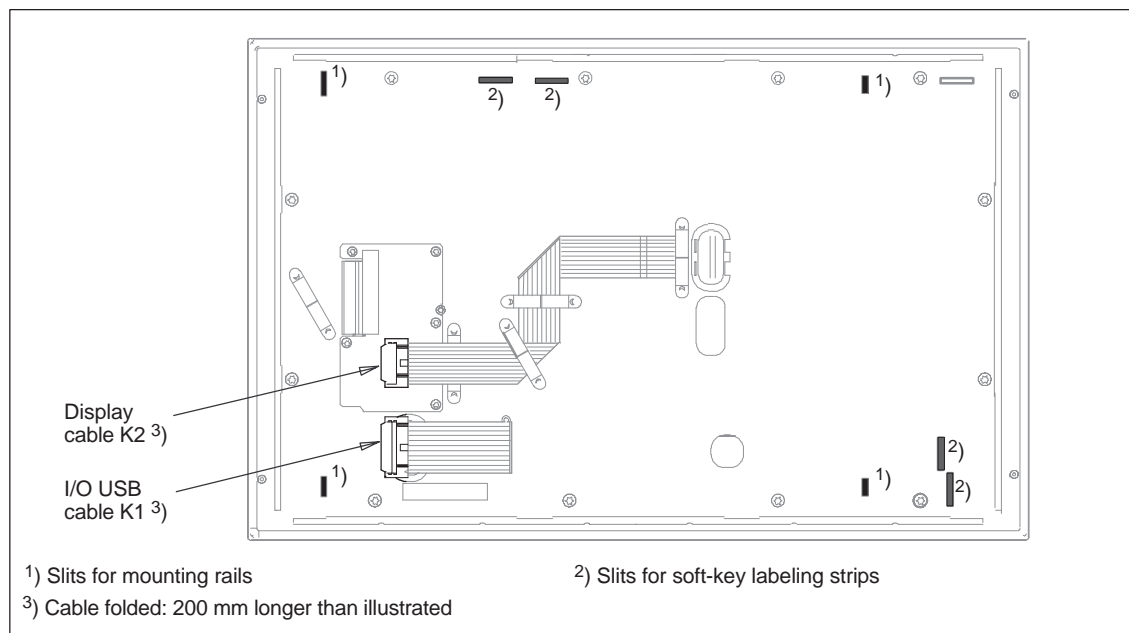


Fig. 4-4 Rear side of operating panel with positions of interfaces

### Securing the computing unit

Reinstall and swing the computing unit back into place in the reverse order to that described above (see also Section 3.2).

### 4.3 Replacing soft key labeling (operating units with key-based front panels only)

The two horizontal and two vertical rows of soft keys of the operating units with key-based front panels can be assigned user-specific functions. You can use two printed labeling strips to identify the soft keys.

A4 foil sheets are available for you to prepare the strips for insertion.

Procedure:

1. Print the foil with a laser printer.
2. Cut the labeling strips along the preprinted lines.
3. Insert the strips through the slits provided on the rear side of the operating unit (see Figure 4-5).

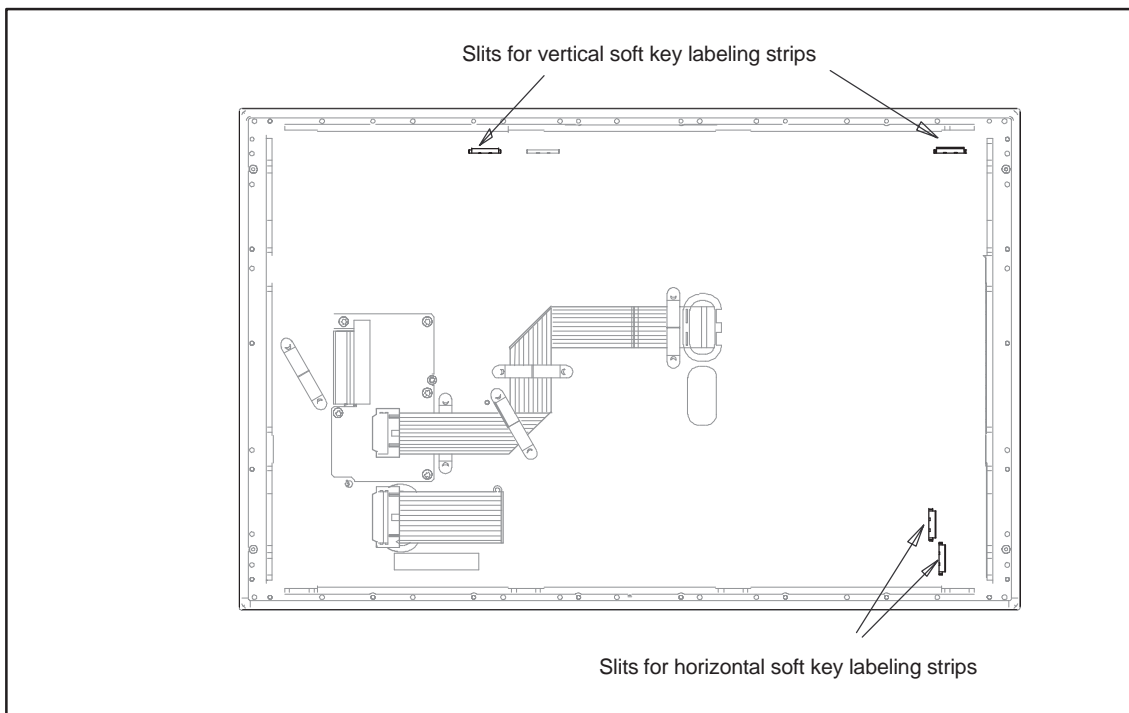


Fig. 4-5 Rear side of the operating unit with connections and slits for the soft key labeling strips

# Appendix A: Technical Data

# A

## A.1 Technical data of operating unit

Table A-1 Panel PC technical data

Color display	10.4" TFT <sup>1)</sup>	12.1" TFT	15.1" TFT	12.1" TFT <sup>1)</sup> Touchscreen	15.1 " TFT Touchscreen
Resolution	640 x 480	800 x 600	1024 x 768	800 x 600	1024 x 768
MTBF of back-lighting	Typically 60,000 (24 h continuous operation, temperature-dependent)				
Keyboard and mouse					
Touchscreen, analog resistive	—			✔	
Membrane keyboard with alpha/numeric block	✔			—	
Function keys	36 with LEDs			—	
Labeling strips for function keys	✔			—	
Direct-key module	optional (in development)			—	
Front-side integrated mouse	✔			—	
Dimensions/weight					
Front panel (HM = height modules) — in mm — in inches	19" 7 HM 483 x 310 19.0 x 12.2	19" 8 HM 483 x 355 19.0 x 14.0	400 mm 7 HM 400 x 310 15.75 x 12.2	19" 7 HM 483 x 310 19.0 x 12.2	
Mounting dimensions PC 670 <sup>2)</sup> W x H x D <sup>3)</sup> — in mm — in inches	450 x 290 x 110 17.7 x 11.4 x 4.33	450 x 327 x 140 17.7 x 12.9 x 5.51	368 x 290 x 135 14.5 x 11.4 x 5.31	450 x 290 x 140 17.7 x 11.4 x 5.51	
Mounting dimensions PC 870 <sup>2)</sup> W x H x D <sup>3)</sup> — in mm — in inches	450 x 290 x 197 17.7 x 11.4 x 3.9	450 x 327 x 222 17.7 x 12.9 x 8.74	— —	450 x 290 x 222 17.7 x 11.4 x 8.74	
Weight	Operating unit alone: approx. 6 kg depending on configuration				

<sup>1)</sup> cannot be delivered combined with computing unit PC 870 (see chapter 2)

<sup>2)</sup> operating unit combined with computing unit

<sup>3)</sup> mounting depth incl. space for ventilation; equipped with CDROM drive: + 20 mm (+ 0.79 ")

Interfaces			
USB		1 x front panel *), 1 x rear panel (internal connection to the computing unit)	
Safety			
Protection class		Conforms to VDE 0106 T1: 1982 (IEC 536)	
Degree of protection	a.	with screw fixing	IP 54
	b.	with clamp fixing, gasket and inserted rubber plug for USB interface	IP 65
	c.	touchscreen version without front-side USB interface, with clamp fixing and gasket	NEMA 4 and IP 65, indoor use only
Safety regulations		IEC, corresponding to DIN VDE 0805/11.93	
Electromagnetic compatibility		CE, EN 50081-2, EN 50081 (EN 55022), IEC 1000-4-2, IEC 1000-4-4, IEC 1000-4-5, ENV 50140, ENV 50204	
Certification		CE, UL 508/CSA, FCC	
Power supply		Typically approx. 13 W, max. approx. 21 W	
Oscillation load in operation		10 to58 Hz: 0.075 mm, 58 to 500 Hz: 1 g	
tested to		DIN IEC 68-2-6	
Shock load in operation		50 m/s <sup>2</sup> , 30 ms, 100 shocks	
tested to		DIN IEC 68-2-29	
Ambient conditions			
Heat dissipation		by natural convection	
Temperature limit values			
– in operation		5°C ... 45°C	
– in storage/transport		–20°C ... 60°C	
tested to		DIN EN 60068-2-2: 1994, DIN IEC 68-2-1, DIN IEC 68-2-14	
Limit values for rel. humidity			
– in operation		5 ... 80 % at 25 °C	
– in storage/transport		5 ... 95 % at 25 °C	
tested to		DIN IEC 68-2-3, DIN IEC 68-2-30, DIN IEC 68-2-56	
Temperature variation		max. 10 K/h	
Mositure condensation		not permissible	
Intake air		without aggressive gases	
Warranty period		24 months	

\*) not for NEMA-standard versions (see “Degree of protection”, version c.)



## A.2 Keyboard table (operating units with key-based front panels)

By using the following table, you can check the standard keyboard assignment and the corresponding key codes.

Table A-2 Standard keyboard assignment

Key number	Code	Key label/name
1	43	F10
2	41/s	F20 (Shift F8)
3	09	f
3a1	24/s	&
4	08	e
4a1	20/s	#
5	07	d
5a1	1e/s	!
6	06	c
6a1	38/s	?
7	05	b
7a1	27/s	)
8	04	a
8a1	26/s	(
9	42	F9
10	40/s	F19 (Shift F7)
11	0f	l
11a1	35	'
12	0e	k
12a1	34/A	,
13	0d	j
13a1	34	,
14	0c	i
14a1	34/s	"
15	0b	h
15a1	30	]
16	0a	g
16a1	2f	[
17	41	F8
18	3f/s	F18 (Shift F6)
19	15	r
19a1	35/s	~
20	14	q
20a1	33/AS	°

Key number	Code	Key label/name
21	13	p
21a1	31/s	'
22	12	o
22a1	31	\
23	11	n
23a1	30/s	}
24	10	m
24a1	2f/s	{
25	40	F7
26	3e/s	F17 (Shift F5)
27	26	9
27a1	22/s	%
28	25	8
28a1	22/A	€
29	24	7
29a1	21/s	\$
30	18	u
30a1	33/s	:
31	17	t
31a1	33	;
32	16	s
32a1	36	,
33	3f	F6
34	3d/s	F16 (Shift F4)
35	23	6
35a1	23/s	^
36	22	5
36a1	37/s	>
37	21	4
37a1	36/s	<
38	1b	x
39	1a	w
40	19	v
41	3e	F5
42	3c/s	F15 (Shift F3)
43	20	3
43a1	38	/
44	1f	2
44a1	25/s	*
45	1e	1

Key number	Code	Key label/name
46	2c	(BLANK)
46a1	2d/s	–
47	1d	z
48	1c	y
48a1	1f/s	@
49	3d	F4
50	3b/s	F14 (Shift F2)
51	56	-
51a1	57	+
52	27	0
52a1	2e	=
53	37	.
56	2a	(Backspace)
57	3c	F3
58	3a/s	F13 (Shift F1)
61	52	(CURSOR UP)
62	4b	(PAGE UP)
63	4e	(PAGE DOWN)
64	49	(INSERT)
65	3b	F2
66	45	F12
67	29	(ESC)
68	4f	(CURSOR RIGHT)
69	4a	(HOME)
70	50	(CURSOR LEFT)
72	4c	(DELETE)
73	3a	F1
74	44	F11
75	3a/a	(ACK - ALT F1)
76	28	(ENTER)
77	51	(CURSOR DOWN)
79	0b/a	(HELP)
80	2b	(TAB)
80A1	2b/s	(SHIFT TAB)
81	00/c	(CONTROL)
82	00/s	(SHIFT)
82A1	39	(CAPS LOCK)
83	00/a	(ALT)
89	42/s,1	S1 (Shift F9)
90	43/s,2	S2 (Shift F10)

Key number	Code	Key label/name
91	44/s,3	S3 (Shift F11)
92	45/s,4	S4 (Shift F12)
93	3a/c,5	S5 (control F1)
94	3b/c,6	S6 (control F2)
95	3c/c,7	S7 (control F3)
96	3d/c,8	S8 (control F4)
97	3e/c,9	S9 (control F5)
98	3f/c,10	S10 (control F6)
99	40/c,11	S11 (control F7)
100	41/c,12	S12 (control F8)
101	42/c,13	S13 (control F9)
102	43/c,14	S14 (control F10)
103	44/c,15	S15 (control F11)
104	45/c,16	S16 (control F12)

**Explanation of values in the table**

<key number>a1:	Press F <sub>N</sub> key at the same time.
<code value>/s :	SHIFT is also transmitted
<code value>/a :	ALT is also transmitted
<code value>/as :	ALT+SHIFT is also transmitted
<code value>/c :	CTRL is also transmitted

## Appendix B: ESD Guidelines

# B

### What does ESD mean?

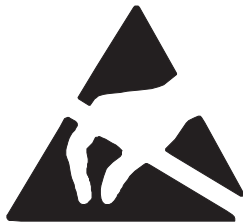
Virtually all present-day modules incorporate highly integrated MOS devices or components. Due to the technologies used, these electronic components are very sensitive to overvoltages and consequently therefore to electrostatic discharge:

These devices are referred to in German as Elektrostatisch Gefährdeten Baulemente/Baugruppen: **EGB**.

The more frequent international designation is:

**ESD** (Electrostatic Sensitive Device).

The following symbol on plates on cabinets, mounting racks or packages draws attention to the use of electrostatic sensitive devices and thus to the contact sensitivity of the assemblies concerned:



**ESDs** may be destroyed by voltages and energies well below the human perception threshold. Voltages of this kind occur as soon as a device or an assembly is touched by a person who is not electrostatically discharged. Devices exposed to such overvoltages cannot immediately be detected as defective in the majority of cases since faulty behavior may occur only after a longer period of operation.

### Precautions against electrostatic discharge

Most plastics are capable of carrying high charges and it is therefore imperative that they be kept away from sensitive components!

When handling electrostatic sensitive devices, make sure that persons, workplaces and packages are properly grounded!

## Handling ESD assemblies

A general rule is that assemblies should be touched only when this cannot be avoided in the course of the work that has to be performed on them. Under no circumstances should you touch device pins or circuitry when handling printed-circuit boards.

You should touch devices only if

- you are grounded by permanently wearing an ESD wrist strap or
- you are wearing ESD shoes or ESD shoe-grounding protection straps in conjunction with an ESD floor.

Before you touch an electronic assembly, your body must be discharged. The simplest way of doing this is to touch a conductive, grounded object immediately beforehand (e.g. bare metal parts of a cabinet, water pipe, etc.).

Assemblies should not be brought into contact with charge-susceptible and highly insulating materials such as plastic films, insulating table tops and items of clothing etc. containing synthetic fibers.

Assemblies should be deposited only on conductive surfaces (tables with an ESD coating, conductive ESD cellular material, ESD bags, ESD shipping containers).

Do not place assemblies near visual display units, monitors or television sets (minimum distance to screen > 10 cm).

## Measuring and modifying ESD assemblies

Perform measurements on ESD assemblies only if

- the measuring instrument is grounded (e.g. by means of a protective conductor) or
- the measuring head has been briefly discharged before measurements are made with a potential-free measuring instrument (e.g. by touching a bare metal control cabinet).

When soldering, use only grounded soldering irons.

## Shipping ESD assemblies

Always store and ship assemblies and devices in conductive packing, e.g. metallized plastic boxes and tin cans.

If packing is not conductive, assemblies must be conductively wrapped before they are packed. You can use, for example, conductive foam rubber, ESD bags, domestic aluminum foil or paper (never use plastic bags or foils).

With assemblies containing fitted batteries, make sure that the conductive packing does not come into contact with or short-circuit battery connectors. If necessary, cover the connectors beforehand with insulating tape or insulating material.

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